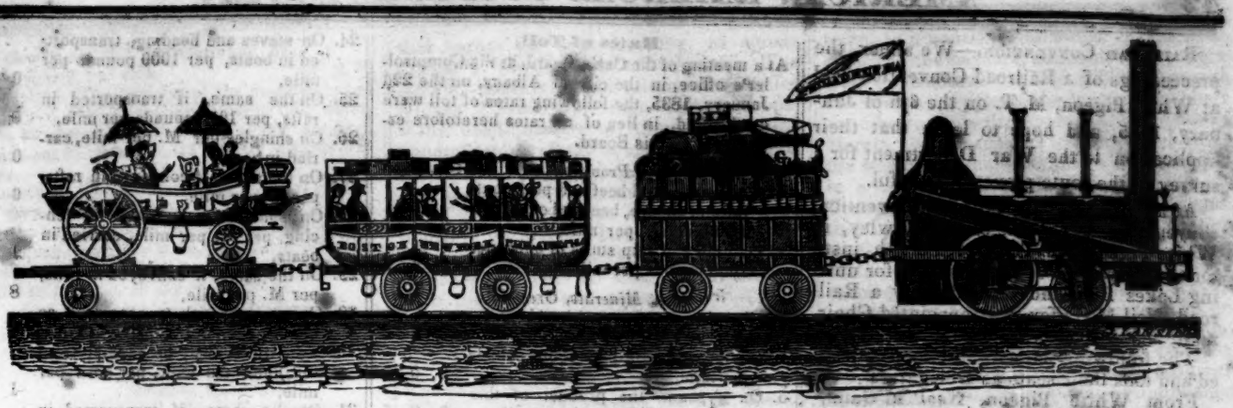

AMERICAN RAILROAD JOURNAL,
AND ADVOCATE OF INTERNAL IMPROVEMENTS.

PUBLISHED WEEKLY, AT No. 35 WALL STREET, NEW-YORK, AT THREE DOLLARS PER ANNUM, PAYABLE IN ADVANCE.

D. K. MINOR, Editor.] SATURDAY, FEBRUARY 7, 1835. [VOLUME IV.—No. 5.

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AMERICAN RAILROAD JOURNAL.

NEW-YORK, FEBRUARY 7, 1835.

Atlantic and New Orleans Seaboard Line Company.—We had occasion, during the last summer, to refer to this new, contemplated, route to New-Orleans, (see vol. iii., No. 31, Aug. 9, of this Journal)—and, from the information then before us, were disposed to think favorably of it. Some time after, and during a long absence of the Editor in the country, a communication, signed "Civis," was received, in which doubts were expressed as to the feasibility of the route. This communication, which we now publish, (see page 68,) was mislaid, and only recently came to light. We also publish in this number, several other articles relating to the route, with one or two short extracts from the charter of the company, and ask attention to the subject, as it is one in which many of our citizens are much interested.

Books are, we understand, to be opened in this city for subscriptions to the stock, of which the customary notice, we presume, will be given.

New-York and Erie Railroad.—On the 4th instant, an election took place to fill vacancies in the Board of Directors, after which Mr. James G. King was elected President in the place of Mr. Eleazar Lord, who resigned the office. The following gentlemen now compose the Board of Directors, and they will, we are sure, give character, and ensure success, to the undertaking.

James G. King, John Duer, Goold Hoyt, James Boorman, S. B. Ruggles, Stephen Whitney, P. G. Stuyvesant, George D. Wickham, Eleazar Lord, Peter Harmony, John G. Coster, Michael Burnham, Elihu Townsend, John Rathbone, jun., J. G. Pearson, Jeremiah H. Pierson, Joshua Whitney.

On the last page may be found an account of the proceedings of the Board at their last meeting.

Auburn and Syracuse Railroad.—The following gentlemen were, on the 20th Jan., chosen by the stockholders, directors of this company. They hold their office until the first Monday of June, 1836:

Nathaniel Garrow, Elijah Miller, Geo. B. Throop, John M. Sherwood, Stephen Van Anden, Richard Steele, John Seymour, Abijah Fitch, Edward E. Marvine, Asaph D. Leonard, Vivus W. Smith, Henry Raynor, and Allen Warden.—[Syracuse Constitutionalist.]

Important to Merchants and Travellers.—The Pittsburg Advocate of Thursday last, contains an advertisement, from which we learn that some enterprising gentlemen of that city have determined to establish a *daily line of steamboats between Pittsburg and Louisville!* Thirteen steamboats will be attached to the line, which will commence regular trips on the 23d of February. A boat will leave Pittsburg daily, at 10, o'clock A. M., Wheeling at 10, P. M., and Cincinnati at 5, P. M. touching, as far as is practicable, at intermediate places, at regular hours.

[*From the Albany Argus.*]

Amount of taxable property in the State, and the amount paid from the general fund to the canal fund.—We copy the following statement taken from a report made to the Senate by the Comptroller, on Saturday, in answer to a resolution of that body:

"The taxable value of the real and personal estates of the people of this State, as ascertained by the assessments for the year 1834, is as follows, viz:

Real estate,	$345,403,230
Personal estate,	107,599,971
Total,	$453003,201

"The statement marked B. exhibits the amount of capital stock of all the corporations in the State liable to taxation, and the real estate held by each; arranged under the heads of the several counties in which the corporations are situated.

"There may be corporations in the State liable to taxation, which are not included in this list, although great pains have been taken for the last year to obtain returns from all existing corporations, and to get information in relation to those which had become extinct. To effect this object, a list was made out in 1833, of every corpotation found in the session laws from 1791 to 1833, a period of 42 years, and circulars were sent to such as had not made to this office the annual returns required by the 3d sec. p. 415, 1 R. S. The list made out contains nearly one thousand incorporations of every description. The number of those now in existence and liable to taxation, as given in the statement marked B., is two hundred and fifty-one. There are a great number of turnpike, manufacturing and other companies in operation in the State which are not embodied in the list reported, for the reason that their dividends are not such as to make them taxable; and a great number of the corporations originally granted have become extinct.

"The capital of all the corporations in the State liable to taxation, amounts to $52,998,919 81

"The amount of stock held by the State, or literary or charitable institutions, amounts to the sum of 632,598 00

"Leaving a total amount of stock and real estate liable to taxation, in all the incorporated companies in the State, of $52,366,391 81

"The total amount of real estate held by all the corporations which are liable to taxation, is $3,882,857 78, which sum is embraced in the total of taxable capital as stated above.

"The taxable property of the State may be classed as follows, viz:

Real estate owned by corporations,	$3,882,857 78	
Amount of stock for which corporations are taxed	48,483,534 03	
		$52,366,391 81
Real estate other than that owned by corporations,	341,520,372 22	
Personal estate other than that assessed to corporations,	59,116,436 97	
		400,636,809 19
Total, as shown above,		453,003,201 00

"The amount of the contributions from the general fund to the Erie and Champlain canal fund, from 1816 to 1834, are as follows, viz:

Vendue duty,	$3,193,807 61
Salt duty,	1,872,329 68
Avails of land sales, (Grand Island, &c.)	63,543 80
Appropriations from Treasury,	42,957 09
Total,	$5,172,638 18

RAILROAD CONVENTION.—We annex the proceedings of a Railroad Convention held at White Pigeon, M. T. on the 6th of January, 1835, and hope to learn that their application to the War Department for a survey of the route proves successful.

At a meeting of the Railroad Convention, convened at the house of Dr. Rowley, in White Pigeon, on Tuesday, the 6th inst., for the purpose of devising means for uniting Lakes Erie and Michigan by a Railroad, Neil M'Gaffey, was appointed Chairman, and Joseph L. Jernegan, Secretary.

The following named gentlemen appeared and took their seats as Delegates.

From White Pigeon, Neal M'Gaffey, Isaac Adams, Robert Clark, Jr. Mr. Judson, David Clark, Charles Kellogg, and H. Loomis.

From Constantine, W. T. House, and E. P. Clarke.

From Mottville, H. L. Stewart, and Elias Taylor.

From Michigan City, Ia., William Teall, and David Sprague.

From St. Joseph county, Ia., G. W. Fowler.

From Goshen, Ia., Joseph L. Jernegan, James R. M'Cord, and John D. Defrees.

From Elkhart, Ia., George Crawford, William A. Nelson, and P. S. Kenyon.

From Perrysburgh, Ohio, Willard V. Way, and Albion N. Olney.

From Lagrange Co. Ia., O. C. Ward, E. Littlefield, and T. Gale.

From Toledo, M. T., Stephen B. Comstock, and Andrew Palmer.

From Bristol, Ia., L. M. Alveson.

The object of the Convention having been explained, it was, on motion,

Resolved, That the importance of a railroad from the navigable waters of Maumee river to the south end of Michigan lake, demands a vigorous effort on the part of those residing in the vicinity of the route.

Resolved, That a committee of five be appointed by the Chairman to draft a memorial to Congress expressive of the views of this Convention, and praying for the survey of the route contemplated by the last resolution.

Resolved, That we view with pleasure the efforts making in New-York to connect the city of New-York with Lake Erie by a Railroad, and that we consider it of great National importance, that a continued road should be made on the shore of Lake Erie, to connect with the contemplated road from the navigable waters of Maumee river to the southern extreme of Lake Michigan.

Resolved, That this Convention solicits the co-operation in this work, of the States of Ohio, Pennsylvania and New-York, and that we will use all suitable means to encourage its commencement and completion.

Resolved, That Philander Chase, Joseph L. Jernegan, and Neal M'Gaffey, be appointed a corresponding committee to communicate with the Secretary of War, and such other persons as may be able to afford assistance in the furtherance of the objects of this Convention.

Resolved, That the proceedings of this Convention be published in the Michigan Statesman, and in such other papers in the states of Ohio, Indiana and Illinois, as may be disposed to promote the objects of this Convention; and that a copy be forwarded to the delegate in Congress from M. T., and to those Representatives in Congress whose constituents are interested in the accomplishment of the work.

N. M'GAFFEY, Chairman.
JOS. L. JERNEGAN, Secretary.

Rates of Toll.

At a meeting of the Canal Board, at the Comptroller's office, in the city of Albany, on the 22d January, 1835, the following rates of toll were established, in lieu of all rates heretofore established by this Board.

No.		Cts. m. fr.
	Provisions.	
1.	On flour, salted beef and pork, butter and cheese, beer and cider, per 1000 pounds, per mile,	0 4 5
2.	On bran and ship stuffs in bulk, per 1000 pounds per mile,	0 4 5
	Iron, Minerals, Ores, &c.	
3.	On salt manufactured in this state, per 1000 pounds per mile,	0 2 3
4.	On foreign salt, per 1000 pounds per mile,	3 0 0
5.	On gypsum, the product of this state, per 1000 pounds per mile,	0 2 5
6.	On brick, sand, lime, clay, earth, leached ashes, manure and iron ore, per 1000 pounds per mile,	0 2 5
7.	On pot and pearl ashes, kelp, mineral coal, charcoal, pig iron, broken castings and scrap iron, per 1000 pounds per mile,	0 4 5
8.	On stove and all other iron castings, going to or from tide water, per 1000 pounds per mile,	0 5 0
9.	On copperas and manganese, going towards tide water, per 1000 pounds per mile,	0 5 0
10.	On bar and pig lead, going towards tide water, per 1000 pounds per mile,	0 4 5
	Furs, Peltry, Skins, &c.	
11.	On furs and peltry, (except deer, buffalo and moose skins,) per 1000 pounds per mile,	1 4 0
12.	On deer, buffalo and moose skins, per 1000 pounds per mile,	0 7 0
13.	On sheep skins and other raw hides of domestic animals of the United States, per 1000 pounds per mile,	0 4 5
14.	On imported raw hides of domestic and other animals, per 1000 pounds per mile,	0 9 0
	Furniture, &c.	
15.	On household furniture, accompanied by, and actually belonging to, families emigrating, per 1000 pounds per mile,	0 4 5
16.	On carts, wagons, sleighs, ploughs and mechanics' tools, necessary for the owner's individual use, when accompanied by the owner, emigrating for the purpose of settlement, per 1000 pounds per mile,	0 4 5
	Stone, Slate, &c.	
17.	On slate and tile for roofing, and stone ware, per 1000 pounds per mile,	0 5 0
18.	On all stone wrought, or unwrought, per 1000 pounds per mile,	0 2 5
	Lumber, Wood, &c.	
19.	On timber, squared and round, per 100 cubic feet per mile, if carried in boats,	0 5 0
20.	On the same, if carried in rafts, per 100 cubic feet per mile,	1 5 0
21.	1st—On boards, plank, scantling, and sawed timber, reduced to inch measure, and all siding, lath, and other sawed stuff less than one inch thick, carried in boats, (except such as is enumerated in regulations number 23 and 32,) per 1000 feet per mile,	0 5 0
	2d—On mahogany, (except veneering,) reduced to inch measure, per 1000 feet per mile,	1 5 0
22.	On the same, if transported in rafts, per 1000 feet per mile,	2 0 0
23.	On sawed lath of less than five feet in length, split lath, hoop poles, hand spikes, rowing oars and broom handles, per 1000 pounds per mile,	0 2 0
24.	On staves and heading, transported in boats, per 1000 pounds per mile,	0 2 0
25.	On the same, if transported in rafts, per 1000 pounds per mile,	0 5 0
26.	On shingles per M. per mile, carried in boats,	0 1 0
27.	On the same, if conveyed in rafts, per M. per mile,	0 4 0
28.	On split posts, and rails for fencing, per M. per mile, carried in boats,	2 0 0
29.	On the same, if conveyed in rafts, per M. per mile,	8 0 0
30.	On wood for fuel, (except such as may be used in the manufacture of salt, which shall be exempt from toll,) and tan bark, per cord per mile,	1 0 0
31.	On the same, if transported in rafts, per cord per mile.	2 0 0
32.	On sawed stuffs for window blinds, not exceeding one-fourth of an inch in thickness, per 1000 pounds per mile,	0 5 0
	Agriculiural Productions, &c.	
33.	On cotton, per 1000 pounds per mile,	0 4 5
34.	On live cattle, sheep and hogs, per 1000 lbs. per mile,	0 5 0
35.	On horses, (and each horse when not weighed, to be computed at 900 pounds,) per 1000 pounds per mile,	0 5 0
36.	On rags, per 1000 pounds per mile,	0 4 5
37.	On hemp and tobacco, going towards tide water, per 1000 pounds per mile,	0 4 5
38.	On hemp, going from tide water, per 1000 pounds per mile,	0 4 5
39.	On wheat and all other agricultural productions of the U. States, not particularly specified, and not being merchandize, per 1000 pounds per mile,	0 4 5
40.	On merchandize,	0 9 0
	Articles not enumerated.	
41.	On all articles not enumerated or excepted, passing *from* tide water, per 1000 pounds per mile,	0 9 0
42.	On all articles not enumerated or excepted, passing *towards* tide water, per 1000 pounds per mile,	0 4 5
	Boats and Passengers.	
43.	On boats used chiefly for the transportation of persons and navigating the Erie Canal between Schenectady and Utica, per mile	11 0 0
44.	On boats used chiefly for the transportation of persons, and navigating the Erie Canal, west of Utica, per mile,	6 0 0
45.	On boats used chiefly for the transportation of persons, and navigating the Champlain or Champlain and Junction Canal, per mile,	6 0 0
46.	On boats used chiefly for the transportation of persons, and navigating the Oswego Canal, per mile,	6 0 0
47.	On boats used chiefly for the transportation of persons, and navigating the Cayuga and Seneca Canal, and the lateral canal to East Cayuga village, or either of them, per mile,	6 0 0
48.	On boats used chiefly for the transportation of persons navigating the Junction Canal, and not connected with regular lines of boats for the transportation of persons on the Erie or Champlain Canals, per mile,	50 0 0
49.	On boats used chiefly for the transportation of property, per mile,	2 0 0
50.	On each person over eight years of age, transported in a boat used chiefly for the transportation of persons, per mile,	0 2 0
51.	On each person over twelve years of age, transported in a boat used	

chiefly for the transportation of property, per mile, 0 2 0

Resolved, That articles of the manufacture of the United States, coming towards tide water, are to be charged as heretofore, at the rate fixed for non-enumerated articles coming towards tide water.

Resolved, That the foregoing rates of toll be, and they are hereby established; and that the same be hereafter charged and collected on the several canals of this State, in lieu of all rates of toll heretofore established upon any or either of the said canals, or any part thereof.

STEPHEN VAN RENSSELAER,
SAMUEL YOUNG,
WM. C. BOUCK,
JONAS EARLL, Junior,
MICHAEL HOFFMAN,
Canal Commissioners.

A. C. FLAGG,
JOHN A. DIX,
GREENE C. BRONSON,
A. KEYSER,
Commissioners of the Canal Fund.

[From the Asiatic Journal.]

THE OVERLAND JOURNEY FROM INDIA.—Dr. James Burnes, who was one of the passengers in the Hugh Lindsay steamer, from Bombay, in letters to his friends, extracts of which are given in a Scotch paper,* has furnished an account of the voyage and journey, from whence we extract some of the most material circumstances.

The steamer sailed on the 1st February, under the command of Capt. Wilson, with an agreeable party of passengers.† She carried thirteen days' supply of coal; her average sailing was not more than six knots an hour, varying from four and a half to eight, although the weather was fine. From Cape Fartash, which was described on the 9th, the steamer skirted the Arabian shore, along a gloomy and thinly peopled coast. On the 11th, she took in a supply of coals at Maculla, a paltry town of dirty hovels, overlooked by barren mountains of great height, and inhabited by 1,000 or 1,500 half naked savages, most of whom were armed with swords, daggers, and shields. On visiting the Shekh or governor and his son, whom they found seated on a mat in the corner of a wretched apartment, during the interview, some negroes among the attendants were offered them for sale by persons in the room.

Owing to the rejoicings for the termination of the Ramazaan, the coals could not be got on board till the 13th, when the Hugh Lindsay weighed anchor, and on the 15th entered the Red Sea, the weather being unusually fine; but the next day her progress was checked by a strong N. W. gale off the desert island Jebel Zyghar, and Captain Wilson put back to Mocha. The decline of this celebrated city, owing chiefly to the imbecile and dissolute character of the Iman of Senna, was marked by the absence of ships from its harbor; an American trader and two Egyptian men of war were all that were seen in the roads. The city itself was in the possession of a body of wild Bedouin Arabs, who had seized and sacked it some days before. The streets were a spectacle of desolation, most of the inhabitants having fled to the desert, and nothing being exposed for sale in the bazaars. The rude Arab chief, however, who had established himself as governor, received our countrymen very civilly.

Early on the 18th, the steamer resumed her voyage, and continued to propel against a constant gale till the evening of the 22d, when off Jedda, though she could not enter that harbor till next morning, in consequence of the dangerous coral reefs. The streets, markets, and numerous coffee houses of Jedda were found full of troops, —the head-quarters of Ahmet Pacha, the generalissimo of the army of the Hedjaz, destined for the subjugation of southern Arabia, being then within a few miles of it. The soldiers were armed and disciplined in the French fashion; but were far inferior in every respect to Indian sipahis. There were eight or nine Italian officers with the army; and, strange to say, a St. Simonian Frenchman, who had penetrated into that distant country, with the double purpose of searching for the *mere*, and disseminating his doctrines. In this lately bigotted city our travellers overtook the Rev. Joseph Wolff, who preached fearlessly with the Bible in his hand, at one of the chief entrances, to a crowd of at least 200, composed chiefly of armed soldiers, who offered him no indignity. The European visitors were most courteously received by Suleiman Aga, the Governor; they walked without molestation through the Medina gate to inspect the tomb of Eve, and the cantonment of the troops; and no objection was made (except by some idle children, who threw a few stones at them,) to their re-entering by the Mecca gate at sunset, so as to witness the departure of the pilgrims, which Dr. B. describes as a most interesting spectacle. That day's caravan (for one leaves Jedda every evening for Mecca) consisted of 200 or 300 camels, which carried the aged and infirm amongst the pilgrims, most of whom, however, strode boldly forward, barefooted and bareheaded. Amongst them were several Persian and Hindostan Mussulmans; and there were some, who, from their countenances, must have met at this spot from the confines of China and Tartary, and the west coast of Africa.

On the 25th the Hugh Lindsay proceeded on her voyage, and again encountered an almost continual tempest to Cosseir. The decks were constantly wet, and the paddle-boxes broken by the force of the sea, which was so heavy that her speed at one time was reduced to two or three miles an hour. Late on the evening of the 28th the land of Egypt was visible at a distance, and at four o'clock on the 1st of March, she anchored at Cosseir; from whence, after landing some passengers for Thebes, she again sailed on the 2d, and ran a distance of 260 miles over smooth water, in about thirty-nine hours. Early on the 3d she entered the Straits of Jubal, and dropped anchor on the morning of the 4th in Suez roads. The Hugh Lindsay had now completed her voyage; and though struggling for nearly 1000 miles amidst the dangers of the Red Sea, against a strong adverse gale and heavy waves, had run 3242 miles in 31½ days, including stoppages, which amounted to 6½. She is, however, described as a vessel unsuited for long passages; and, in addition to the extra weight of coals, was encumbered with two heavy engines of eighty-horse power to a tonnage of little more than 400.

Suez and Cosseir are miserable towns, composed chiefly of clay-built houses, and almost entirely dependent on the pilgrims who pass through them for Mecca. The Cavendish Bentinck, an English ship, having carried away 500 or 600 of these wanderers from the former, a few days before the steamer arrived, it looked particularly desolate. The streets of Cosseir, however, were full of well-dressed Mahommedans of all nations; and the number of vessels in its port showed it to be a place of considerable resort, though it can never be a populous town, as it contains no water except what is sold in the bazaars, and which is brought from the banks of the Nile, 125 miles across the desert. At Suez, the water is so bitter as to be scarcely drinkable. On the 5th of March, the passengers disembarked from the steamer, and after taking a slight repast in a room which had been occupied by Bonaparte, about two o'clock commenced their journey across the Isthmus of Suez to Cairo, 75 miles, Capt. Wilson and two of the officers of the Hugh Lindsay having resolved to accompany them. The caravan consisted of twelve gentlemen mounted on dromedaries, attended by Arab guides, and followed by thirty or forty camels, carrying the water, baggage, tents, and requisite supplies. This journey was accomplished in four days, and was attended with few of the usual discomforts, as the party had furnished themselves with most of the comforts and even luxuries of life, in respect to provisions. One had brought London soups and Scotch salmon; another produced a ham and tongues; a third, French bouille, champagne, claret, &c. Fowls, mutton, and bread, were in profusion; and, in fact, there was abundance of every thing except water, which some of the party had neglected to bring in bottles from Bombay, and a quart of which was considered more valuable than wine before the journey was over. On the 8th, they met the poor Dey of Algiers, who, with his harem and attendants, was proceeding to Mecca; and by one o'clock they entered one of the stupendous Saracen gates of Cairo, having, in the course of a short half hour, made a transition from a silent wilderness into the heart of a mighty metropolis, swarming with human beings, and filled with interesting objects.

They remained at Cairo five days, inspecting the curiosities in the city and its neighborhood, and were presented to the Pasha, who, though the war in Yemen appeared to be his favorite topic, declared his intention of making a railroad across the Isthmus of Suez, for which purpose English engineers are already engaged in surveys. On the 13th, Dr. Burnes and some of the party embarked at Boulac, on the Nile, entered the Mehmoudieh canal, and arrived at Alexandria, which on the 20th he left, with the Rev. Mr. Wolff, for Malta, where they arrived on the 4th April, and were shut up in the Lazaretto for twenty days.

* The Montrose Review.

† See p. 148, As. Intell., &c.

Proposed Line of Communication between N. York and N. Orleans, via Savannah, &c.

To the Editor of the Railroad Journal:

SIR,—I enclose you a Report of a meeting held in Savannah, on the 15th inst., on the subject of the contemplated communication between this city and New-Orleans, via Isthmus of Florida. You may deem it worthy of re-publication in your valuable Journal, Very truly, &c.

R. P.

Savannah, January 28, 1835.

ATLANTIC AND NEW-ORLEANS SEABOARD LINE COMPANY.—At a meeting of merchants and other citizens, favorable to the establishment of a line of communication between New-York and New-Orleans, by the way of Savannah, Florida, &c. held at the City Hotel on the evening of the 15th inst., Joseph Cumming, Esq. was called to the chair, and Wm. Robertson appointed secretary.

The Chairman having briefly explained the object of the meeting, it was addressed by Mr. R. King, who detailed the immense advantages to be derived should the project

be carried into effect, supported by estimates of the cost, income, &c.; after which, the secretary having read the Charter of the Atlantic and New-Orleans Seaboard Line Company, granted by the Legislature of Georgia, the following resolutions offered by Mr. King, and advocated by the Chairman, and other gentlemen present, were unanimously passed.

Resolved, That this meeting considers the project of the Atlantic, New-Orleans, and Seaboard Line Company, as one of great public advantage and convenience, and that, under its charter, well sustained, a safe, practicable, and profitable route from New-Orleans and Mobile, thence to Savannah, and, by steam-packets, to New-York, in the space of eight or nine days, can be opened and used; and that the same be recommended to the citizens of this State, New-York, the Territory of Florida, Alabama, and Louisiana.

Resolved, That the Commissioners be recommended to assign One Hundred Thousand Dollars of the stock of said company to the city of Savannah; Seventy-five Thousand Dollars to the city of New-York; and Seventy-five Thousand Dollars to the cities of New-Orleans and Mobile.

Resolved, That in aid of the commencement of the Atlantic and New-Orleans, and Seaboard Line Company, the citizens of Savannah should come out with promptness and energy, and subscribe the stock of said company; and that R. F. Williams, G. W. Anderson, Peter Mitchell, B. Burroughs, M. H. M'Allister, G. Shick, and Geo. Hall, be a committee to assist the commissioners under the charter, in having the said stock subscribed on the first day of the opening of books."

The foregoing proceedings were then ordered to be published in the gazettes of this city, and the meeting adjourned.

JOSEPH CUMMING, Chairman.
WM. ROBERTSON, Secretary.

Washington City, Aug. 12, 1834.

To the Editor of the Railroad Journal:

SIR,—In your Railroad Journal of the 9th instant, you speak of a plan in contemplation for improving the travelling route from Savannah, Georgia, to Mobile and New-Orleans. This plan proposes to employ steam-boats from Savannah, along the coast to St. John's, then up that river to Black Creek, one of its branches. This latter, it is supposed, has sufficient depth of water for steam-boats for 28 or 30 miles. From the highest point navigable, a road is to be constructed in a line across the Isthmus to the Santaffe river; the line then takes down this to the Suwanne, into which it empties—from hence the proposed route to the Gulf is not clearly designated. The Suwanne is no doubt navigable for common steamboats, the greater part of its length from the Santaffe to the Gulf, but it becomes more difficult as the Gulf is approached; has no harbor at its mouth, and only three or three and a half feet of water on the bar fronting the estuary; this and for near one hundred miles towards Mobile, there is no harbor into which an ordinary sized coasting vessel could enter and find shelter from the frequent storms of the coast of the gulf. At St. Mark's only could a harbor be formed. This route then may be considered as impracticable.

The line proposed by that eminent engineer, General Barnard, for the canal, after it had reached the Suwanne, and approached within 40 or 60 miles of the Gulf, was to strike off westwardly to St. Mark's, and run nearly parallel with the coast, distance about 70 or 90 miles. If this line is selected for the new road, it will add so much to the land travelling as to make the whole distance not less than about 120 miles, instead of 41, as conjectured by your correspondent.

There are other difficulties opposing the scheme suggested in your paper, which do not appear to have been known to its author. The navigation from the Savannah to St. John's is far from being safe or easy. The entrance into the St. John's, from the Atlantic especially, is regarded as dangerous and uncertain, and no safe shelter for the vessels which enter it for many miles above its mouth.

The author of the above short remarks has been induced to present them to the public with a view to invite more particular inquiry into a subject in which it is deeply interested. A reference to the report made by General Bernard in 1829, and published by order of Congress, would afford much useful information in relation to it. He was employed many months in making the survey, and the accuracy of the results may be confidently relied on. It may be added, that if it was practicable to pass down the Sawanny into the Gulf, the difficulties of farther navigation would be almost insurmountable. Mobile is not less than 500 miles west of the mouth of the Sawanny, and there is no way to reach it but by direct navigation through the Gulf, the coast, at least for 200 miles, is so shallow that no vessel can approach within many miles of it in all that distance.

Very respectfully, &c.
CIVIS.

---

* Mr. King's estimate of proposed route from New-York to New-Orleans, via Savannah, in eight or nine days:

Estimate of Cost.	
2 New-York steamboats	$100,000
2 Savannah do.	50,000
2 New-Orleans do.	70,000
10 Stages and Harness,	5,000
150 Horses,	15,000
Opening roads,	10,000
Capital required,	$250,000

Supposed Weekly Expenses.		
2 New-York boats, each	$1,250	$2,500
2 Savannah do.	625	1,250
2 New-Orleans do.	1,250	2,500
10 Stages, drivers, and keeping 150 horses,		500
Extra expenses,		2,000
		$8,750

Supposed Weekly Receipts.

Estimated on a travel of 3000 passengers annually to, and same number from, (in this estimate no allowance is made for way passengers, or carrying the Mail.)

Average 75 passengers on and 75 from—150,	$11,250
Deduct weekly expenses,	8,750
Clear gain per week,	$2,500
" annual gain—$130,000.	

[For the American Railroad Journal.]

Steamboat and Stage Route along the Atlantic, and Gulf Coast, connecting the Principal Commercial Depots, from Charleston to New-Orleans.

From Charleston to the St. John's river, in Florida, there is an inland passage for steamboats drawing not more than 5 ft. water, and approaching the ports of Beaufort, S. C., and those of Savannah, Darien, and St. Mary's, in Georgia, at such convenient distances, that they may be made touching points on the route.

From Charleston to Beaufort,	45 miles.
" Beaufort " Savannah,	30 do.
" Savannah " Darien,	65 do.
" Darien " St. Mary's,	60 do.
" St. Mary's " the junction of inland passage with St. John's river,	30 do.
	230

The St. John's river is navigable for steamboats of the largest class to Lake George, and to the forks of Black creek, one of its tributaries which approaches nearest to the waters of the Gulf of Mexico.

From the north of inland passage, on the St. John's to Jacksonville, the county seat for Duval,	20 miles.
From Jacksonville to the mouth of Black creek,	20 do.
From Black creek to its forks,	15 do.
	55 miles.
From this point to a navigable point on the Santa Fee, a tributary of the Suwanne river, over a high dry ridge, susceptible of a good road, would not, on a straight line, exceed	50 miles
By the present route (somewhat circuitous) travelled, it is 60 miles.	
The Sante Fee is not at this time navigable, owing to decayed and falling timber which have obstructed occasionally the passage; General Bernard reported, however, that they were easily removed.	
The distance from a navigable point to the Suwanne,	20 do.
From the mouth of the Santa Fee to the mouth of the Suwanne river,	20 do.
The Suwanne is obstructed near its mouth by banks of oyster shells, over which not more than 4½ or 5 feet of water can be carried. From the mouth of Suwanne to the St. Marks, the coast is a low, flat, marshy shore; no beach, and no breakings of the sea. An outer reef of rocks, &c. protects this part of the coast from the heavings of the ocean, and renders this passage between perfectly safe for steamboats of the smallest class, or least draft of water; barges, and even common flats, have navigated this passage without injury.	
From Suwanne to St. Marks,	70 do.
Up the river to the Devil's Elbow, four miles; from thence to St. Mark's town, four,	8 do.
From St. Marks to the mouth of the Apalachicola river,	55 do.
There is an inland passage through St. George's Sound for the greater part of this distance.	
	223 mls.

After describing the present route of travelling from the Appalachicola to Mobile, our informant proceeds thus—

Should it be deemed however more advisable to continue the steamboat route without these land interruptions, a sea steamboat might pass from the mouth of the Appalachicola to Mobile Bay, touching at Pensacola, and unite with the Orleans steamboats at their landing-place, on the rear of Mobile, and opposite Dauphine Island.

The same stages which meet at that

point from Mobile could convey the passengers in either direction. By this route there would be no continuous inland passage, though very fine bays, such as St. Joseph's, St. Andrew's, and Santa Rosa, would afford safe harbors of refuge in case of storms.

Distance from Appalachicola to Pensacola,	140 miles.
Thence to St. Joseph's Bay, 30 miles.	
" St. Andrew's, 25 do.	
" Santa Rosa, or Chorlawhatchie Bay, 50 do.	
" Pensacola, through the Santa Rosa Sound, 35.	
From Pensacola to Mobile Bay,	40
" Mobile Bay to point of junction with Orleans steam boats,	25
	205 miles.

In the last distance the boats would have to pass through Pass Heron, a passage between Dauphin Island and the Main, which I do not think is at this time practicable for steam-boats drawing more than three feet water. It is susceptible, however, of improvement, and an appropriation to that effect by Congress was very advantageously expended the last year, but was inadequate to the accomplishment of the object contemplated. The report of the engineer was favorable, however, and there can be no doubt of an additional sum being granted, provided the object of opening the navigation of that pass should become so important, as it would, in connexion with the steam-boat route now in agitation.

WHOLE DISTANCE.

From Charleston to St. John's, (water,)	230 miles.
St. John's to forks of Black Creek, (water,)	55
From forks of Black Creek, over-land, to Santa Fee, (land,)	50
Santee Fee to mouth Suwanne river	40
Suwanne to St. Mark's, (sea coast,)	70
To St. Mark's	8
Appalachicola	55
Pensacola	140
Junction with Orleans steam boats	65
Total distance, land 50; water,	663
Distance from the point of junction with Orleans boats	200
Land	50
	913 miles.

EXTRACTS FROM

An Act to incorporate the Atlantic and New-Orleans Seaboard Line Company.

Whereas, Joseph Cumming, S. B. Parkman, Geo. Hall, Robert Habersham, Ralph King, Wm. Duncan, and others, have, by their petition, represented that with a view to establish a shorter, more safe, and expeditious route from the Atlantic Seaboard to New-Orleans than the one around the cape of Florida, they have formed themselves into an Association, under the name and style of the Atlantic and New-Orleans Seaboard Line Company, and in order to insure and establish their said association in a permanent and effectual manner, so that the attainment of their object may be more facilitated, have prayed the Legislature to grant them an Act of Incorporation.

Be it therefore enacted by the Senate and House of Representatives of the State of Georgia in General Assembly met, and it is hereby enacted by the authority of the same, That the said Joseph Cumming, S. B. Parkman, Ralph King, Wm. Duncan, and their associates, be, and they arehere by declared a body corporate, by the name and style of the Atlantic and New-Orleans Seaboard Line Company, and by the said name shall have perpetual succession of officers, and members, with power, by their said corporate name, to sue and to be sued, plead and be impleaded, and of using all necessary and lawful means for recovering or defending any property, debts, demands, which they may have or claim in behalf of said Company, to hold real and personal estate, and have and use a common seal, and the same, at pleasure, to alter or change, and with power to make, alter, change, and amend, such by-laws as may be necessary, and agreed upon by the said Company.

Sec. 2. Be it further enacted by the authority aforesaid, That the capital stock of said company shall be the sum of two hundred and fifty thousand dollars, to be divided into shares of five hundred dollars each, with liberty to increase the said capital stock to one million of dollars.

THE SUWANNE.—A new entrance has been discovered to this river. We have seen the gentleman who made the survey. The harbor is behind the Cedar Keys, about ten miles to the southward of the Western Pass. This passage is narrow, but it is not difficult to enter, and will admit vessels 12 or 14 feet draught. From this point there is a channel behind the island, eight or nine feet deep, sufficient for steamboats of any burthen. Opposite to the harbor, on the main land, there is a high bluff shore, affording an eligible site for a town. There is much good land in the immediate vicinity, and on the upper branches of the Suwanne, which extends nearly three hundred miles into the country. To the South, there is an inland channel extending along the coast to the mouth of the Amaxura, a river which has much good land on its shores, but no harbor at its mouth. This will add to the value of the discovery. It was unfortunate that the engineer who formerly made the survey was not attended by a competent pilot. His failure to make any useful discovery at this point, we do not consider detracts any thing from his merits as an engineer.—[Tallahassee Floridian.]

[From the London Mechanics' Magazine.]

The Claims of Mathematical Science.

SIR,—I much regret that, in honoring your pages and myself with some remarks on my recent article on mathematics and the mathematicians, Mr. Exley did not extend his observations to a greater length, for he is well entitled, because he is well qualified, both as a mathematician and a philosopher, both as a man of universal information, of varied learning, and of powerful ratiocination, to pronounce an opinion on the subject in discussion, deserving the most respectful attention. I am the more bound not to withhold a proper tribute to his merits, because I have already taken, and may have further occasion to take, exception in some degree to his theory of physics, and in the present paper intend to offer some strictures in opposition to his remarks. Not that I would deprecate, or admit the necessity of deprecating offence: for so long as observations are offered in the love of truth, and uncontaminated with that uncandid and captious spirit which controversialists, (even among your correspondents,) are too apt to evince, I am fully assured they will be received with "that stronger attachment to truth, than to any erroneous system," which he professes to entertain.

I fear, from his too short but pithy remarks, he has imbibed the impression, that I have labored to decry mathematical science, though my observations, he will observe, are on its *comparative* value and importance. Nay, it is quite in accordance with my views, that even "the mere mathematician is not to be set aside;" for, almost at the very outset, I stated that this class of men "are, doubtless, *valuable members of the body scientific*, but that some among them (the least generally informed) are sadly inclined to over-estimate the honor of their station, and the comparative value and importance of their labors." Apart, therefore, from and besides its obvious misuses, there is surely sufficient ground for animadversion in the fact, that the excessive reverence for this science, (be it usurped or freely bestowed,) which so much prevails, facilitates with a baneful influence on the best interests of philosophy, a too favorable reception for every thing, however crude, which is presented to us clothed in its forms. It certainly is within the verge of useful discussion to consider, whether the primitive and long acknowledged claims of this science to just respect have not *in our day* bribed, and even forced our reason, by its inordinate but imposing pretensions, to a false, because extravagant, estimate of its value and importance. It is true, as Mr. Exley says, "that no one will plead for the misuse or misapplication of the science;" but then there are many who will debate what is or is not deserving of that reproach, and, in the general prostration of the mind to mathematical genius, the danger is that we may esteem as legitimate what may prove to be of spurious birth.

In the rapid march of knowledge—the knowledge of nature,—the general mind has been strengthened and freed, in some measure, from this prejudice; but the time was when it was thought no misapplication of mathematical science to apply it to human physiology—when even the fanciful hypothesis of celestial vortices was thought to be illustrated and particularized in man's bodily frame; and the time may be, when applications now accepted may be thought to be a misuse.

When the mathematics was the only science of which mankind had to boast, it was naturally regarded with unbounded veneration. When the vain philosophy of the schools was discarded, it presented fresh claims for admiration and regard. The feeling has descended to our times, though the circumstances which justified it have passed away. Philosophy has entered, and is daily entering, on other domains than those of quantity; and that science is now but auxiliary, and

only occasionally, to more enlarged, and, let me add, more highly intellectual pursuits. Yet an antiquated and almost exclusive admiration still clings, though with a faultering hold, to the public mind, equalled only by one other prejudice—the reverential respect which is yet awarded to classical learning: these have been respectively fostered by the two Universities, once truly the lights of a by-gone age, but which are now visible only in the pervading darkness of their own precincts.

High mathematical knowledge is not to be turned to account in the ordinary walks of life. Besides, even where the sphere of its exercise is not wanting, other higher and rarer endowments of the mind—those which constitute the philosopher—are requisite to enable its possessor to bring it discreetly and powerfully into operation. Is it not infatuation, then, to allow the mere power over an instrument of knowledge to usurp the place in our estimation which should be assigned to its adroit and skilful use in its wise and efficient applications to appropriate and useful objects? And is it any thing better than infatuation, when we hear it said of any one that he is a great mathematician, if he be nothing better than this, to look up to him as being qualified, in virtue thereof, to take the lead in the ways of knowledge, and to ascribe to him pre-eminent intellectual powers? Some mathematicians will not countenance this delusion. It was said of one of the celebrated French analysts, that he expressed his surprise at finding the study of chemistry to be not more difficult than that of the mathematics; and a distinguished living mathematician is accustomed to say of any thing of little difficulty, that "it is as easy as algebra:" an expression which will find a readier acquiescence; but still it shows, that in this gentleman's opinion, this *kind* of study is not very arduous.

I have just adverted to the two branches of learning which separately distinguishes each University, and which, if not pursued to the entire exclusion of other studies, characterises and gives celebrity to those places respectively, and to which honors more particularly appertain.

Mathematical knowledge and classical literature, it is readily admitted, are of great value, and it would manifest unusual stolidity to deny it.* It is even proper when peculiar aptitude ensures success, that for the purpose of attaining high excellence some should devote their attention almost exclusively to their study; but in regard to persons in general, among whom it would be folly to expect that Parrs and Eulers may abound, and not desirable that they should, it is contended that too much useful time, yea, too many of the world's interests, have been sacrificed to the pursuit of these attainments, which unavailing and unproductive, probably, in their end, have been stimulated only by a false opinion of their all-engrossing importance. The fault consists in allowing brilliant instances of particular and perhaps professional attainments, to seduce our judgment into a magnified estimate of their value, or into a diminished opinion of general acquirements being essential to a liberal education, but which general knowledge, after all, may in many cases be highly conducive to success in the more favored pursuit, and must in most cases be absolutely necessary, in order to render that pursuit, in its application, beneficial to society. Ardent youth is naturally impelled to tread, though with humble steps, the path which men of distinguished talents have irradiated with the halo of their glory. Fired with enthusiasm, all his energies are engaged to follow up the chosen track; he becomes insensible to every thing besides; he is deaf to the voice of wisdom; he responds not to her calls to explore the other avenues of knowledge, but contemptuously regarding them as by-paths, insignificant and obscure, he pushes on, till at last he faulters, and finally he falls short of the high object of his aims; meantime he has lost the goodly prospects which awaited him on every hand, he has enjoyed only a few contracted views, he has had some partial glimpses, and which, to his purblind vision, have appeared to be all that was worth a thought in nature's wide expanse, showing that those illustrious men who, not improperly, have been called the lights of the world, may, under some circumstances, truly prove to be lights, also, which "lead to bewilder, and dazzle to blind." Admit that the aspirants to honor and distinction have succeeded to the very stretch of their ambition, and what do we have as the most favorable result, but men of one idea, men of an exclusive theme, men admirably suited to become the professors of their peculiar learning, but who, in the ordinary affairs of life—yea, in the ordinary walks of knowledge,—manifest a simplicity, not to say an imbecility, which makes even the illiterate smile. Their vocation may be honorable, and the sphere of their duties useful; but still it is the sphere of a class of individuals, and for that reason they ought not to be considered as being the exemplars of the course of study befitting the community of the learned. Besides, though well qualified to be instructors, would they be less, or rather, would they not be much better adapted for that office, if they had taken a more varied and extended survey of things? Would they not enlighten, and more intensely interest us, with illustrations and analogies gathered together out of all the territories of knowledge? Would not their observations be more marked with wisdom, their positions advanced with greater discrimination, and their principles receive that salutary modifying and moderating correction, which enlarged and liberal views fail not to enforce? And, as members of society, would they not be less exacting and less monopolizing of claims to paramount consequence for themselves and their pursuits? Would they not be more moderate, more accommodating, and more distinguished for amenity in general intercourse, and in the transactions of general affairs? In the multifarious concerns of busy life they are manifestly incapable of taking a judicious part. The ruling spirit of their theme mars all their perceptions, sways all their opinions, gives a tinge to all their thoughts, and particularly spoils the faculty of taking a correct estimate of things, for they always refer to their own pursuit as the standard by which they judge of the value of others. The observations contained in this paragraph have been suggested, and may have been illustrated, by some passing events of the day, which it would be indecorous to specify, but the parallel of which most persons will be able to furnish for themselves. I have also to apologise to Mr. Exley for introducing them in this correspondence, for nothing relating thereto, or to him,* has called them forth. They are also becoming too general, for they apply to other subjects besides the mathematics; let us, therefore, return to that which is more immediately before us.

Mathematical knowledge was the first acquirement of man, as it is of men. This is, as Mr. Exley properly remarks, the order of nature; but it is significant also of the simple and elementary nature of the procedure of the understanding by which it is disciplined to its attainment, and it was for the purpose of showing this that the quotation from Blakey's logic was introduced. That it is not more general—that so many "neglect or reject their birthright," as Mr. Exley considers it to be—must not be attributed then to the strong intellect possessed only by a few, which is requisite for its acquirement, but to the repulsive manner, probably, in addition to its not being in itself very attractive, in which it is first presented to our notice. The point which I wished to establish, and to which the testimony of Mr. Exley is the more valuable, because he is peculiarly competent to give it, is the fact, that the mathematics is quite within the reach of ordinary talent. Though I admit, with Mr. Exley, "that mathematics is the first science in the order of nature," it does not follow that I ought also to admit that it is pre-eminent in honor and utility, which it was the drift of my observations

* Why should Mr. Frend continue to impute such nonsense to me, by stating my explanations on this point to be unsatisfactory? Is it impossible, then, to a mathematician to take any other than *extreme* views of a subject, unmodified by influential considerations? or to entertain any other than *ultra* and abstract opinions? To such a course his mind is certainly biassed by his studies; and does not Mr. Frend himself furnish a case in point? To persons of this cast, any thing like discrimination carries the appearance of inconsistency or contradiction.

* I remember, however, that a paper from Mr. Exley, read before the Royal Society, met with very cavalier treatment, in one quarter, merely, it would seem, because it did not chime in with particular individual pursuits; and we all know what intestine broils existed in that learned body, for want of, not to say mutual assistance, but even mutual toleration, among the respective partisans of the several branches of science, and which, as having occurred many years since, may now be properly adverted to as examples for warning and instruction. Let us hope that the British Association for the Promotion of Science will introduce a new era of harmony and co-operation.

to disprove; for mere priority confers no particular value, else would common arithmetic have pre-eminence over the mathematics itself, to which it is the first or elementary step.

Mr. Exley asks, "Why should mathematics be set in opposition to practice? Had Priestly, Franklin, and all practical men, the inventors of steam-engines, and others, been great mathematicians, could this have made them less practical, or less successful in their practice? Who was more practical than Newton? His optics present a model for all practical men." I would say, in reply, that, in all probability, if these men had been great mathematicians they would not have been what they were—the benefactors of mankind; and in proof of this, I refer to what is indisputable, that the great mathematicians have not been practical men, and that the most eminent and successful men in practice have not been mathematicians. It is a curious fact in psychology, which I have in my previous paper endeavored to explain, that these separate pursuits do not proceed together with an even flow, but that one occupies the mind almost to the entire exclusion of the other. Of course there are exceptions, else would the proposition be not the enunciation of a general fact, but a mere truism. Newton was an illustrious exception, and I had myself referred to him as such. He was more than possessed of practical views; he was an operating experimentalist, and a very ingenious one too, and a clever operative mechanic to boot. May I be permitted to say, that these remarks have been occasioned by one who is also an exception, and therefore it is that those pursuits do not appear to him to be discordant. It is true, as he intimates, that they are not "to be set in opposition," if by that he means *irreconcilable* opposition to each other, but rather in juxta-position, by the way of foils and antithesis; but though there is no necessity in the nature of things, there is great probability in the reason of things, that great attainments on either hand should mutually disqualify the mind for the opposite pursuit, and every probability in the course of things that they should incapacitate it—the one for the reception of the other. This view of the subject may appear to some to be better corroborated, by using the converse expression of the fact before stated, that those who have made equal attainments in both pursuits have commonly not been eminent in either. It will be admitted, however, that there have existed an illustrious few, to whom opportunities have not been denied for the exercise of abilities equally rare. The late Dr. Thomas Young was eminently distinguished for practical views; they pervaded and characterised all his studies, and gave a peculiar tone to those which were the most abstract; though, like the gentleman on whose remarks I am now commenting, uncontrollable circumstances may have confined his aims, more than others, to the closet rather than to the laboratory. If, however, these pursuits, so distinct in themselves, are more commonly pursued apart—a course, be it remembered, which is not recommended—it is surely very properly open to discussion, without setting them *injuriously* "in opposition to each other," whether the one or the other is the more arduous, the more useful, the more honorable, or the more intellectual. Without pretending to decide in a case where personal predilections will turn the scale, it is enough for me to put in at least an equal claim to these distinctions in favor of practical pursuits, as including those which are observational, inductive, and experimental; or to bar the speculative one, at any rate, from carrying off all the honors—a triumph which it has been too much the custom to concede to it. I have advanced these claims to estimation not particularly on the ground of utility, which is surely undeniable; for geometry of the highest order, and the science of quantity generally, and as applied to the motions of the heavenly bodies in particular, flourished for ages on the Ganges, without any beneficial influence on the interests of mankind, and was imported into, or revived in Greece, without superseding, or even correcting, the Stagirite's logic and philosophy; but I have advanced them more especially on the bolder and less usual plea, of at least equal if not superior intellectual powers, and as much patient and laborious perseverance being required in those pursuits which trace the connection of *things*, as in that which establishes a connection of *ideas*—in those pursuits which unravel to the core, as in that where we have the naked essence already formed to our hand—in those pursuits which take the subject matter to disembarrass it of its extraneous envelopement of circumstances, as in that where we can conceive of it at will abstractedly, and work with it as such wherewithal—in those pursuits, I say, where, having arrived by an extensive analysis at the elements or principles which are the objects of our research, we have to embrace, in their natural order and degree, the whole circle of combining influences, however diverse in their nature, ere we can erect a philosophic system, or advance a true explanation of phenomena or events, as in that where the materials of a simple though imposing superstructure being called into existence at our bidding, and impressed with qualities at our pleasure, are of one and the same nature, of restricted and homogeneous influence, devoid of interfering and collateral action, and only require for their regular collocation an unembarrassed unilateral proceeding. Besides the reasons now incidentally alluded to, as subsisting in the inherent differences between the separate subjects, I may adduce in proof of my position the indisputable fact, that the speculative science advanced by extensive strides, and was brought to a comparative perfection at a very early period from its foundation; whereas the practical sciences approached to maturity only by slow degrees, and are yet in progress, showing that the difficulty in one case is of a character to be easily and quickly surmounted, and in the other that it is more formidably intrenched. Again, those rapid advances were made comparatively by a few individuals, and though it seems paradoxical, it is not the less true, it was precisely because the laborers were few, that those advances were rapid, extensive, and broadly seen; for if the nature of a work be so toilsome and different as to require a great number to engage in it, the steps of its progress, though innumerable, must necessarily be minute and scarcely perceptible. The speculative science, therefore, must come more naturally and easily within the compass of our faculties, since a few has sufficed to cope with it, and reduce it to order. The paucity of laborers sufficient to produce great effects, argues also that this science does not demand much more than ordinary talents, since the chance of finding those which are extraordinary is in such case greatly lessened. I cannot, however, go so far as to say with Mr. Exley, "we need not wonder, then, that all men are born mathematicians, though many neglect or reject their birthright." This would be to humble their pretensions, more than any one, besides a mathematician, dares to do.

In my next communication I intend to notice those observations of Mr. Exley which refer to his own theory of physics, and to take a slight review of it.

I am, sir, yours, &c.

BENJAMIN CHEVERTON.

October 20, 1834.

P. S.—Mr. Frend has very unnecessarily occupied your pages in quoting various testimonials in favor of Euler and the Bernoullis, for, unquestionably, they were illustrious mathematicians, and I stated as much. As to the *tractory* curves, which he thinks are improperly named, I can only say they were so called by Euler himself, though they defied even his skill to render them *tractable*. The witticism that Mr. Frend founds on this poor equivoque, is about as smart as his invitation to me to give the equations of a few of these "*strange curves*," in which attempt even Euler failed. He further allows himself to say, that certain highly useful *experimental* researches, which he enumerates, "are of course, according to the Chevertonian philosophy, mere matters of moonshine." I would respectfully inquire of Mr. Frend, why he thinks it necessary to resort to misrepresentation, and why the calm face of philosophic discussion should be disfigured with the ebullitions of temper? Those who honored my paper with a perusal, will not be induced by any one to believe that its purport was not precisely to establish the superiority of practical and experimental pursuits over those which are speculative. Mr. Frend has discovered an omission in my enumeration of Kepler's laws, which he contends were three. He is perfectly at liberty to consider it to be *a law* of planetary motion, that the orbits of the planets are ellipses,

though, according to my notions of phraseology, it ought rather to be called *a fact* in the planetary system. It is not unusual to speak in the *dual* number of these laws; but it is even more common, perhaps, to use the singular number, and say, Kepler's law. As a foreigner, sensitively jealous of the fair fame of foreigners, it may be allowed to him to be a little captious.

DR LARDNER'S,
Second Lecture on Steam.

Delivered before the Liverpool Mechanics' Institution.

The celebrated Leslie has invented a method of producing ice, by the employment of sulphuric acid. This acid has such a strong affinity for water, that if it is presented in an atmosphere filled with vapor, it will immediately arise upon the vapor and incorporate it with itself. He places water in a watch glass under the air pump, with sulphuric acid near it: the air being withdrawn from the pump, the sulphuric acid seizes upon the vapor as it rises from the water, and the water, parting with all its heat to maintain the vapor, is converted into ice. In performing this experiment, it is necessary that the vessel containing the sulphuric acid should not be in contact with the water, otherwise the degree of heat which accompanies the combination of the vapor and the sulphuric acid would prevent congelation taking place.

A very pretty experiment, to prove that the atmospheric pressure is a great agent in preventing water from boiling, can be performed with a flask half filled with boiling water, and closed at the neck. If it is in that state plunged into cold water, it will boil: but the ebulition will cease when plunged in boiling water. This is because the cold water condenses the steam in the upper part of the flask, and, by removing the pressure, allows the water to boil; whilst the hot water keeps up the temperature of the steam, which presses on the surface of the water so as to prevent its boiling.

From these investigations it may be concluded, that a liquid or gaseous state is not essential to the nature of any substance, but that its state is entirely dependent on the supply of heat which that substance has access to. We know that water can be passed through these three states, by the abstraction or the application of heat.—Fluid mercury may be evaporated, and the fact ascertained by passing the vapor through a cold tube, and it will again assume a liquid state: it may also be made solid, so as to take a shape like a metal. The most refractory substances we know of are capable of being converted into liquids by heat. All the metals we know of may be brought into a state of fusion by a proper supply of heat: indeed, all substances, by proper treatment, may be seen in the solid, fluid, and aeriform state. By turning the rays of the sun, through a lense, upon gold and platinum, we can decompose them, and convert them into gas.—There is only one solid which has not yielded to fusion, and that is carbon, or the diamond; but we can only conceive, that we cannot reduce it, because we cannot command a sufficient quantity of heat to melt it and maintain it in a liquid state. Of all liquids there is only one which has been congealed by the abstraction of heat, and that is alcohol, or spirits of wine.

We can only argue by analogy, that the bodies which exist in the gaseous state can be reduced to liquids or solids; Which leads us to suppose, that the substances known as atmospheric air, oxygen, hydrogen, &c. are, in fact, nothing but the steam of various substances which cannot exist in the liquid state upon the surface of our globe without being deprived of a large portion of heat. This analogy has been confirmed by recent experiments and discoveries, particularly by those of our distinguised countryman Farrady. Neither steam nor any gas can be reduced to a liquid by compression alone, however high the degree of compression applied to it, notwithstanding the assertions of superficial writers, and even of some who are otherwise well informed, on the subject. But if, by the compression we could squeeze out the heat from the gaseous bodies, we could then liquefy them. Dr. Farrady has substanciated this by actually converting several gasses into liquid. For instance: he found, that when carbonic acid gas was submitted to a presure of 1000 lbs. on the square inch, it became a liquid. It must, however be remarked, that as the pressure is increased the temperature is raised; and it is not until the gas is cooled that liquid is produced. These facts, united with the other analogy afford such a high degree of probability, that, to a reflecting mind, there can be no doubt that every substance in parting with its heat to a certain extent, becomes a solid: and it is possible to conceive, that if, by any circumstances, the temperature of ourglobe were raised sufficiently, the water of the ocean would no longer be able to exist in a liquid form, but would assume the state of vapor, and mix with the atmospheric air. By the same cause, many of the solids would be converted into liquids, and fill the body of the ocean, so that we should have an atmosphere of steam, and an ocean of metal,—a gold and a silver sea. Then, again, by the process of evaporation, which causes liquids to pass into vapors, we should see the fable of Jupiter descending in a golden shower illustrated in golden and silvery showers. To carry the analogy still further; we know that water cannot exist in a liquid state at the poles. A slight decrease in the temperature of the globe, or a change of distance of the sun, would cause all the water of the earth to become solid: a further decrease would freeze the various gases, so that the air would drop down, and form an ocean of water: and a still further reduction of temperature would convert it into a solid body. These circumstances suggest to a reflecting mind the beautiful adaptation of the different objects on the globe to each other, and to the distance of the earth from the sun. Otherwise, those substances which ought to be liquid, for the sustenence of animals, would subsist in the solid state. It is not at all improbable, that the different planets have different substances in them, suitable to their distances from the sun: for there is no doubt that the temperature is produced by the sun, and depends on the sun's distance from the planets, and its intensity is diminished in proportion to its distance. In the planet Jupiter, the heat is twenty-five times less than it is with us; and water, on such a globe, could not exist in a liquid state, unless heat was supplied from other causes than the sun.

When we consider the prodigious mechanical power which has been obtained, by the mere ability, on our part, to convert a liquor or water into steam, and reconvert that steam into water; when we consider the enormous amount of human civilization which has been produced by the due application of this simple physical effect; when we consider, that it is probable that the relations of the human race may be altered and modified by this application, and the very distances of the different parts of the world be changed by a speedy intercourse, and the prices of the objects of consumption be ultimately affected by it: when all these effects are attained by the mere fact of our availing ourselves of the simple physical effect of converting water into vapour and back again, we naturally say, where there is so large a field, and so many different substances from which the effect may be produced, should we not expect, from the large advances which are making in the generalization of these principles, that this effect may be produced from other substances. Water possesses several properties which render it the most hopeless and unfit for such an experiment. In order to convert it into vapour we, of course, apply heat. The least promising liquid is that which requires the largest application of heat; and, of all liquors, water consumes the largest quantity of heat, requiring 1,000 degs. to raise it from a boiling state to a state of vapour: therefore, *a priori*, a philosopher would say, try spirits of wine or a thousand other things, but do not try water, for this special reason. It may be said, that the cost and difficulty of producing any species of vapour does not depend upon the fuel necessary to produce it, but on the cost of the liquid itself. Supposing, then, we could get fuel for nothing, still water is the most unfit and unpromising agent.—For instance: in the transport at sea, the source of heat is derived from coals, which are bulky, and are transported in the vessel in order to produce steam: the water at sea costs nothing: and, suppose the fuel costs nothing, still they must be carried, and they impose a limit to the application of the steam engine to the purposes of navigation. A vessel impelled by steam power of 200 horse, consumes one ton of coals per hour, or twenty five tons per day: therefore, to provide for a voyage of twelve days, it would have to carry with it twelve times twenty-five tons of coals.—Thus, therefore, there is a limit to the application of steam navigation. It is generally understood, that a vessel cannot carry more fuel than is necessary for the purpose of propelling it ten or eleven days; consequently, by the present steam impelling power, such a voyage as from Liverpool to New York could not be made for any practical and advantageous purposes.

In considering the prospects of improvement in these respects, we naturally look towards those liquids which are most readily turned into a gaseous form. Ether and alcohol are easily converted into vapor, but in the way in which the steam-power has been applied these liquids are rather expensive. If it was used in a high-pressure engine, the vapor would escape into the air and be lost; whilst, in a condensing engine, although not lost, it would be mixed with so much water that its separatiou would be attended with considerable expense. There is only one other way in which it is possible to use alcohol, namely, by condensatiou, in contact with a cold surface. If we introduce the vapor of spirits of wine into a thin shell, formed by two bodies placed one upon another, after working the engine, it will spread over the cold surface of the hollow shell, the steam will be reconverted into a liquid state, and trickle out at the bottom, so as to be warmed over again, and this might be carried on from time to time.

But this great step must be followed by another improvement in the steam-engine, especially for the purposes of transport both by land and by water, which will doubtless be cultivated in our own time. It is the application of the gases, and especially of carbonic acid gas, in a liquid form. If we could obtain carbonic acid in sufficient quantity, and on sufficintly moderate terms, there is no reason why it should not be employed to supersede steam at the present time. This gas takes the liquid form at the common temperature, under a pressure of 1,000 lbs., and in that state exerts a prodigious power, and from its small bulk, would effect a saving of tonnage. The difficulty to its adoption lies in the price of the liquid, the providing of proper air-tight valves and pistons, and in guarding against the corrosion which the carbonic acid would cause in the materials themselves. But all these are matters of detail, and are at present but temporarily difficult, and we may, therefore, look forward to the superseding of coals altogether in the steam engine, by the use of the liquid carbonic acid, as nothing would be necessary except to send it into the receiver, and let the piston of the engine work as with steam; possibly it might be found expedient to apply heat, but a trifling degree only could be applied, as the power of the gas is so great that it has no bounds. Thus we should get rid of the magnitude of the marine boiler, and a thousand other inconveniences which attend it. We may, therefore, look forward to the time when we may send our captains to sea with the wind that is to blow them in their waistcoat pocket; and it is not impossible, that we may get rid of those ugly smoky chimnies, which are at once so unpoetical and unpicturesque, and against which our sailors so bitterly complain, because they deface the surface of our beautiful sea.

A railroad was about to be constructed between Havana and the town of Guines, and a loan of two millions authorized in England, to carry the plan into effect.

Bridge across the Hudson.—At a highly respectable meeting held at Albany on Wednesday, Feb. 4th, a committee of 30 was appointed to draw up a petition to the Legislature on the subject of a bridge across the Hudson.